

**CORPORATE PURCHASING SPECIFICATION**

AA 12101

Rev. No. 03

PREFACE SHEET

COLD ROLLED BRASS SHEET, STRIP AND FOIL (ANNEALED)**FOR INTERNAL USE ONLY****REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS****Equivalent/Comparable Standards:**

- 1. INDIAN** IS 410-1977 (Reaffirmed 1996)
Gr; Cu Zn 37 (O)
- 2. AMERICAN** ASTM B 36M - 1991 a alloy C 27200
- 3. BRITISH** BS 2870 -1980 Grade CZ 108(0)
- 4. GERMAN** DIN 17660 -1983.
DIN 17670-1983. Gr.
Cu Zn 37 (F30)

User Plants & Replaced Plant Specifications / References:

- 1. BHOPAL** P.S. 12041
- 2. HARD WAR** 0502-211
IS: 410-1967, Gr.
Cu Zn 37 (H)
- 3. HYDERABAD** IS: 410 -1967
Gr.CuZn 37(a)
CSN: 423213.1
ASEA: 23150-02

Revisions :Refer Cl. No. 13.3 of MOM MRC (NFC&W)
Cl.16.3.41 of MOM of MRC-NFCW+HE**APPROVED:****INTERPLANT MATERIAL RATIONALISATION
COMMITTEE - MRC (NFCW+HE)**

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PAGE 1 OF 4

COLD ROLLED BRASS, SHEET, STRIP AND FOIL (ANNEALED)

1. GENERAL:

This specification governs the requirements of cold rolled brass sheet, strip and foils.

2. APPLICATION:

Industrial machines, Controlgear, Boiler feed pump motors and Steam turbine components.

3. CONDITION OF DELIVERY: Annealed.

4. COMPLIANCE WITH NATIONAL STANDARDS:

The material shall comply with the requirements of the following national standard and also meet the requirements of this specification.

IS : 410 - 1977(Reaffirmed 1996) | SPECIFICATION FOR COLD ROLLED
Gr. Cu Zn 37(0) | BRASS SHEET, STRIP AND FOIL

5. DIMENSIONS AND TOLERANCES :

5.1 The material shall be supplied as per the dimensions specified in the order.

5.2 Tolerances:

Tolerances on thickness, width and length of cold rolled sheet, strip and foil shall be normal as per IS 3052.

6. MANUFACTURE:

The sheet, strip and foil may be manufactured by cold rolling process.

7. FREEDOM FROM DEFECTS :

The material shall be clean, smooth and free from harmful defects.

8. CHEMICAL COMPOSITION:

The chemical composition of the material, when analysed in accordance with IS:3685 (Methods of chemical analysis of brasses) shall be as follows :

Element	Percent	
	Min.	Max
Copper	61.5	64.5
*Lead		0.30
* Iron		0.075
Zinc		Remainder
*Total impurities (Including Iron)		0.60

** Note: These elements need not be determined when the material supplied conforms to Mechanical properties specified in this specification. However, the supplier shall ensure that the composition of the material lies within the limits specified above.*

Revisions:

Refer Cl. No. 13.3 of MOM MRC (NFC&W)
Cl.16.3.41 of MOM of MRC-NFCW+HE

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INTER PLANT MATERIAL RATIONALISATION
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9. TEST SAMPLES :

9.1 Quantities of sheet (or strip) of the same width, thickness and temper shall be batched together. For each batch the number of samples taken shall be as given below :

The samples shall be cut off cold in longitudinal direction and shall receive no further treatment (Except that they may be machined to the shape of the test piece) before being tested.

9.1.1 From batches weighing up to 1000 kg the number of samples taken shall be in the proportion of one per 200 kg of material submitted, and fractional remainder being considered as 200 kg. Where strip is supplied in coils weighing more than 200 kg, one sample shall be taken from each coil to provide the necessary test piece. If BHEL requires more than one sample to be taken from any coil, the method of taking the additional sample or samples shall be agreed to between the supplier and *BHEL*.

9.1.2 Batches exceeding 1000 kg shall be sub-divided into smaller batches of not less than 200 kg and not more than 1000 kg to which the provision of 9.1.1 shall then apply.

9.2 From batches weighing upto 1000 kg the number of samples taken shall be in proportion of one per 200 kg of material submitted and fractional remainder.

10. MECHANICAL PROPERTIES:

10.1 Tensile strength and Hardness:

The material when tested in accordance with IS: 1608 (Method for tensile testing of copper and copper alloys) and IS : 1501, Part 1 (Method for Vicker's hardness lest for copper and copper alloys) shall show the following properties

Tensile strength N/mm ² , Min.	% Elongation on 50 mm gauge length Min.	Hardness (HV5) Max.
275	40	80

Note:

1. Tensile strength shall be carried out for material above 0.5 mm thickness.
2. Percentage elongation determination shall be carried out for material above 0.8 mm thickness and above 12 mm width



CORPORATE PURCHASING SPECIFICATION

AA 12101

Rev. No. 03

PAGE 3 OF 4

10.2 Bend Test:

Where possible the material shall be subjected to a transverse bend test made on test piece cut with their major axes at right angles to the direction of rolling; where this is not possible it shall be subjected to a longitudinal bend test, made on test pieces cut with their major axes parallel to the direction of rolling. Both surfaces of the test piece shall be tested. The test pieces shall not crack when bent once through the appropriate angle as specified below :

Transverse Bend		Longitudinal Bend	
Angle Deg.	Radius.	Angle Deg.	Radius
180	Close	180	Close

The bend test shall be made in accordance with IS : 1599. The test pieces shall be of convenient length and width shall be 12 mm for thickness upto 6 mm and twice the thickness for over 6 mm thickness.

The longer edges shall be carefully rounded and smoothed longitudinally so that for material upto 3.0 mm thick cross-section has approximately semi-circular edges; for material over 3.0 mm thick the edge shall be rounded to a radius of 1.5mm

11. MICRO STRUCTURE:

It shall reveal annealed structure with the following grain size:

0.015 mm Min.

0.035 mm Max.

12. OPTIONAL TEST:

If specified, in the drawing/order the material shall be tested for its electrical conductivity. The electrical conductivity of the material at 20° C shall be 25.65-28.35 percent I ACS.

13. RETEST CLAUSE:

Should any of the (test pieces first selected, fail to pass the prescribed tests mentioned under various clauses in this specification, two further samples from the same batch shall be selected for testing, one of which shall be from the same component from which the original test sample was taken, unless that component has been withdrawn by the supplier.

Should the test pieces from both these additional samples pass, the batch represented by the test sample shall be accepted. Should the test pieces from either of these additional samples fail, the batch represented by the test sample shall be rejected.

14. INSPECTION AT SUPPLIER'S WORKS :

Tests and inspection are to be conducted in the presence of the customer's representative. The representative shall have free access at all times while the work on the contract is being performed, to all parts of the manufacturer's works. The supplier shall offer the purchaser's representative all reasonable facilities, without charge, to satisfy the latter that the material is being furnished in accordance with this specification. The supplier shall prepare and provide necessary test specimens for testing to be carried out at his premises. If facilities are not available at his works, the supplier shall make necessary arrangement for carrying out the prescribed test elsewhere.

**15. TEST CERTIFICATES :**

The supplier shall submit 5 copies of test certificates giving the following information.

BHEL Order No.

AA 12101 (Rev. No. 03) Cold Rolled Brass Sheet, Strips and Foil Annealed.

Supplier's Reference and Name.

Batch No.

Results of chemical analysis, mechanical test and microstructure as called for in this specification/order

Consignment/Identification No.

16. PACKING AND MARKING:

The material shall be suitably packed to prevent corrosion and damage during transit. Each package shall be legibly marked with the following information:

BHEL Order No.

AA 12101: Cold Rolled Brass Sheet Strip and Foil. (Annealed)

Batch No.

Identification mark/No.

Weight

Supplier's Reference and Name.

17. REJECTION AND REPLACEMENT :

In the event of the material proving defective in the course of preparation, machining, forming, fabrication, testing etc., such material shall be rejected notwithstanding any previous certification of satisfactory testing and/or inspection.

The supplier shall undertake to replace the material, free of charge, without any delay and arrange to take back the rejected material at his own cost.